C L A I M S

1. A method of transmitting a radio signal with polarization diversity, comprising the steps of: transmitting a plurality of versions of the radio signal having different polarizations from a first station to a second station; and adaptively controlling respective transmission powers of said versions of the radio signal according to measurements carried out by the first station on signals transmitted by the second station.

2. The method as claimed in claim 1, wherein said versions of the radio signal are transmitted simultaneously.

3. The method as claimed in claim 1, wherein an optimal transmission power distribution of the radio signal between the polarizations is estimated on the basis of minimizing a cost function relative to a quality of the signal received by the second station, and the transmission power is distributed between said versions of the radio signal in accordance with the estimated distribution.

4. The method as claimed in claim 3, wherein the cost function to be minimized measures an error probability in receive mode.

5. The method as claimed in claim 3, wherein transmission parameters for signals transmitted by the second station to the first station and parameters for the receiving by the second station of said versions of the radio signal transmitted with polarization diversity by the first station are measured, and said

measured parameters are transmitted to the first station in order to estimate the optimal transmission power distribution.

6. The method as claimed in claim 5, wherein said second station is designed to transmit with polarization diversity, the method further comprising the steps of:

- for each transmit polarization, measuring a mean power contribution of at least some of the signals transmitted by the second station;
- for at least some of the signals transmitted in a defined polarization by the first station to the second station, measuring a mean power contribution of the noise that interferes in receive mode with the useful signal relating to said transmitted signal; and
- for each transmit polarization, evaluating at the first station power transfer coefficients in a radio propagation channel of at least some of the signals transmitted by the second station.

7. The method as claimed in claim 6, wherein the mean noise power contribution and mean transmission power contribution measurement steps are executed in the second station and the measured mean noise power contribution and mean transmission power contribution are transmitted to the first station for estimating the optimal distribution of the transmission power.

8. The method as claimed in claim 5, wherein said second station is designed to transmit with polarization diversity, wherein the mean power contribution of the signals transmitted by the second station is substantially identical for each

polarization , the method further comprising the steps of:

- measuring a mean power contribution of at least some of the signals transmitted by the second station;
- for at least some of the signals transmitted in a defined polarization by the first station to the second station, measuring a mean power contribution of the noise that interferes in receive mode with the useful signal relating to said transmitted signal; and
- for each transmit polarization, evaluating at the first station power transfer coefficients in a radio propagation channel of at least some of the signals transmitted by the second station.

9. The method as claimed in claim 8, wherein the mean noise power contribution and mean transmission power contribution measurement steps are executed in the second station and the measured mean noise power contribution and mean transmission power contribution are transmitted to the first station for estimating the optimal distribution of the transmission power.

10. A radiocommunication station with polarization diversity, comprising means for transmitting a plurality of versions of a radio signal having different polarizations to a remote radiocommunication station, means for measuring parameters on the basis of signals transmitted by said remote station, and means for adaptively controlling the respective transmission powers of said versions of the radio signal according to said measured parameters.

11. The radiocommunication station as claimed in claim 10, wherein the transmission means are coupled to n_pol antennas, n_pol being a number greater than or equal to two, and are designed to transmit from each antenna a radio signal in one polarization from among n_pol polarizations.

12. The radiocommunication station as claimed in claim 10, wherein the means for adaptively controlling the transmission powers comprise means for estimating an optimal distribution of the transmission power of the signals transmitted with a defined polarization, on the basis of minimizing a cost function relating to the quality of the signal received by the remote station, and means for driving the transmission means so as to distribute the transmission power according to the estimated distribution.

13. The radiocommunication station as claimed in claim 12, wherein the means for estimating the optimal transmission power distribution comprise means for minimizing an error probability in receive mode by the remote station.

14. The radiocommunication station as claimed in claim 12, further comprising means for obtaining parameters for the transmitting of signals by the remote signal and for the receiving of signals transmitted to the remote station, cooperating with the means for estimating the optimal transmission power distribution.

15. The radiocommunication station as claimed in claim 11, further comprising receiving means coupled to the n_pol antennas sensitive in receive mode to the n_pol polarizations, and wherein the means for estimating the optimal transmission power distribution cooperate with

means for obtaining parameters for the transmitting of signals by the remote station and for the receiving of signals transmitted to the remote station and with means for obtaining parameters for the receiving of signals transmitted by the remote station.

16. The radiocommunication station as claimed in claim 15, wherein the means for obtaining parameters for the receiving of signals transmitted by the remote station comprise means for obtaining, for each of the n_pol polarizations, a mean power contribution of at least some of the signals transmitted by the remote station and means for estimating power transfer coefficients for signals transmitted by the remote station in each of the n_pol polarizations and received on each of the n_pol antennas.

17. The radiocommunication station as claimed in claim 15, wherein the means) for obtaining parameters for the receiving of signals transmitted by the remote station comprise means for obtaining a mean power contribution of at least some of the signals transmitted by the remote station and means for determining power transfer coefficients for signals transmitted by the remote station in each of the n_pol polarizations and received on each of the n_pol antennas.

18. The radiocommunication station as claimed in claim 15, wherein the means for obtaining parameters for the receiving of signals transmitted by the remote station comprise means for estimating symbols transmitted by the remote station in each of the n_pol polarizations, and received on each of the n_pol antennas, and means for combining the estimated symbols.

19. The radiocommunication station as claimed in claim 14, wherein the means for obtaining parameters for the transmitting of signals by the remote station and for the receiving of signals transmitted to the remote station comprise means for obtaining, for at least one of the signals transmitted to the remote station in one defined polarization among n_pol, a measurement of a mean power contribution of the noise that interferes with the useful signal relating to said transmitted signal.

20. The radiocommunication station as claimed in claim 14, wherein the means for obtaining parameters for the transmitting of signals by the remote station and for the receiving of signals transmitted to the remote station comprise means for measuring, for each of the n_pol transmission polarizations, a mean power contribution of at least some of the signals transmitted by the remote station.

21. The radiocommunication station as claimed in claim 11, wherein n_pol = 2.

22. A radiocommunication terminal, comprising means for receiving and processing signals transmitted with polarization diversity in n_pol polarizations by a radiocommunication station of a network infrastructure, n_pol being a number greater than or equal to two, means for measuring, for at least some of the signals transmitted by said radiocommunication station in a defined polarization among n_pol, a mean power contribution of the noise that interferes with the useful signal relating to said transmitted signal, and means for transmitting said mean noise power contribution measurements to the radiocommunication network infrastructure.

23. The radiocommunication terminal as claimed in claim 22, comprising means for receiving and processing signals transmitted with polarization diversity in n_pol polarizations on n_ant antennas, n_ant being greater than or equal to 2, means for evaluating, for each of the n_pol polarizations, power transfer coefficients in a radio propagation channel of at least some of the signals transmitted by said radiocommunication station, and means for transmitting the evaluated coefficients to the radiocommunication network infrastructure.

24. The radiocommunication terminal as claimed in claim 22, further comprising means for transmitting radio signals in said n_pol polarizations from n_ant transmission antennas, means for measuring, for each of the n_pol transmission polarizations, a mean power contribution of at least some of the signals transmitted by said transmission means, and means for transmitting said measurements to the radiocommunication network infrastructure.

25. The radiocommunication terminal as claimed in claims 24, wherein n_ant = 2.

26. The radiocommunication terminal as claimed in claim 22, further comprising means for transmitting, with a substantially identical mean power contribution, radio signals in said n_pol polarizations from n_ant transmission antennas, means for measuring a mean power contribution of at least some of the signals transmitted by said transmission means, and means for transmitting said measurements to the radiocommunication network infrastructure.

27. The radiocommunication terminal as claimed in claims 26, wherein n_ant = 2.

28. The radiocommunication terminal as claimed in claim 22, wherein n_pol = 2.